

# Thinking and Governing Differently: Old Ideas , New Discoveries and New Ways of Thinking for Governing



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**PGI Working Paper**

**Thinking and Governing Differently:  
Old Ideas , New discoveries and New Ways of Thinking for Governing**

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Edited By: Jocelyne Bourgon P.C., O.C.**

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## Abstract:

A web of inter-related problems exists in our highly interconnected and interdependent world, posing significant challenges to governments and public sector leaders. The New Synthesis of Public Administration (NS) argues that addressing the problems of the 21st century require a *different way of thinking* than the one inherited from the industrial age. It calls for a significant mental shift from seeing the role of government as a series of disaggregated actions and decisions to a dynamic perspective that brings together the role of government, citizens and society to generate solutions to the complex problems we are facing collectively.

System thinking plays a central role in the NS conceptual framework and the NS Exploratory Cycle. This challenges the *mechanistic view of the world and the reductionist approach to problem solving that has dominated public administration over the last 100 years.*

## Points for Practitioners:

This working paper examines systems thinking literature; complex adaptive systems; and living systems theory and their relevance to the New Synthesis of Public Administration (Bourgon, 2017) . More specifically, it examines how system thinking paradigm is embodied in New Synthesis (NS) as an enabling framework and whether new findings would warrant updating the NS conceptual framework. The NS of Public administration provides a paradigm shift in the thinking about public administration, governance and the role of government in the 21st century.

**Key Words:** Complex Issues. Government. Governance. Interconnectedness. System Thinking. Complex Adaptive Systems. Living Systems Theory. New Synthesis. Public Policy.

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# Foreword

The New Synthesis (NS) Initiative was launched with the explicit purpose of exploring the *new frontiers* of public administration to provide practitioners with a mental map that would better equip them to face the challenges of serving in the 21st century.

The NS initiative has been underway for the past ten years because of the interest of country partners and collaborators in exploring the *New Frontiers of Public Administration*. This foreword covers the phases of the NS journey.

The core question of the initial phase was “*what is different about serving and governing in the 21st century?*” People serving in government today are facing a combination of factors

that is significantly different from those prevailing during the post-World War II period to the early 2000s; increasing complexity, hyper-connectivity, high uncertainty, a technological revolution, a digital and biological revolution, the acceleration of environmental changes, rapid changes to the nature of work, the impact of social media, etc. These factors are transforming the economic, social, technological, environmental and political spheres of life in society. The velocity of change is accelerating and there is every reason to believe that it will continue to accelerate.

The *first phase* of the New Synthesis (NS) was the result of the work of six countries and 200 participants from a broad spectrum of academic disciplines including ecology, psychology, complexity theory, dynamic systems as well as the traditional disciplines of governance, political science, economics and public administration. It led to a *conceptual framework* that brings together the role of government, citizen and society in dynamic and interactive interrelations that transform society. The NS framework equips practitioners with a broader mental map of the role of governments in society and expands the range of options open to them to bring about the desired public outcomes.

The *second phase* focused on “*what can*

*we do to ensure that the capacity of government to invent solutions will keep pace with the increasing complexity of the problems we are facing as a society?*” It generated the *NS Exploratory Cycle* based on the work of 1,000 practitioners from various countries including Australia, Brazil, Canada, Denmark, Finland, Estonia, Malaysia, the Netherlands, Singapore, the United Kingdom, and other EU member states. This work validated the relevance of the NS Framework for public sector leaders. The NS exploratory cycle invites public sector leaders to focus on societal results, collective problem-solving and the active contribution of citizens and communities to invent solutions to complex public policy challenges.

The second phase revealed the need to explore more deeply the importance of civic results to propel society forward in a period of unprecedented changes. Civic results include:

*Civic capacity:* The capacity of people, families and communities to take charge of issues and to initiate actions with others and with government in a manner that addresses their concerns and promote the overall interest of society.

*Civic will:* The will to deploy capabilities to build and share a better future and to contribute to collective problem solving.

*Civic spirit*: The will to build and share a better future as member of a broader human community.

*Civic values* (norms and public ethics): Shared values and normative behaviors that contribute to harmonious living and making society governable.

The NS Initiative is now entering a new phase.

The **third phase** is intended to explore more deeply the part of the NS Framework dealing with civic results and to explore how they affect the overall functioning of a governing system. This is a challenging undertaking. Several factors are acting as *accelerators of changes* that transform the economic, societal, political and environmental landscape.

A blended approach that brings academic findings and practitioners' insights has been the trade-mark of the NS Initiative. A similar approach is envisaged for the third phase of the NS Initiative. This would mean bringing together 3 or 4 countries with a significant interest in the domain to share practical experience, challenges and insights. Each partner would host one international roundtable over the course of 2019-20. *Canada and Singapore* have already signaled an interest. The PGI Team would support the network, conduct literature reviews and ensure coordination

among partners and participants. The NS 2019 Research Agenda directs us to four questions in particular:

- What can government do to build the collective capacity (and collective will) of society to invent and share a better future together? (What factors contribute to building collective or civic capacity; what factors erode collective capabilities)
- What can government do to ensure that the adaptive capacity of society will keep pace with the increasing velocity of change?
- What can government do to enhance the resilience of society to adapt, evolve and prosper in unforeseen and unpredictable circumstances?
- What must be done to ensure that public institutions have the capabilities to successfully steer society through an unprecedented period of change?  
A measure of success would be to generate useful and usable insights to help practitioners think through challenges and to set a course adapted to their context. This working paper contributes to the NS 2019 Research Agenda.

*“In a spider’s web, what happens on one part of the web affects every other part. The same is true of a living system, whether it be an ant colony, a forest or a city. Like spider’s web, a living system is so intricately woven that no part exists in isolation” (Sweeney, 2011:1).*

## Introduction

The governance scene of the 21st century is characterized by complexity, interrelationships and an accelerating velocity of change due to the impact of several factors including the info-bio technological revolution that is currently underway. This gives rise to unprecedented challenges for governments and public sector leaders. The NS Initiative has argued that this requires a *different way of thinking* than the one inherited from the industrial age.

Bourgon (2011) has put forward a conceptual framework significantly different from conventional thinking. It provides a dynamic understanding of public administration that stresses the importance of the interrelationships between government, people and society. Bourgon (2011:16) argues that the “Classic model” of public administration that “saw government as primarily a provider of services” remains relevant but is insufficient to guide public sector leaders’ actions and decisions to invent solutions to the complex problems of the 21st century. Serving in the 21st century requires a deliberate, systematic, holistic, and dynamic approach to collective problem solving.

Bourgon (2011: 23) further notes that “we live in a networked society that consists of a web of networks interacting with each other. Complex issues put a premium on the capacity of government to take account of a multitude of interdependencies among actors, sectors and parts of the world, and to work across multiple boundaries.” This view echoes Linda Booth Sweeney’s (2011) analogy of the interconnectedness of a spider’s web; it is also consistent with the views of several other system thinkers, and global governance scholars. Fritjof Capra, a Physicist and systems theorist, explored the concept of interconnectedness in great detail in his 1996 book, *The Web of Life: A New Scientific Understanding of Living Systems*: “[the] web of life is an ancient idea, which has been used by poets, philosophers, and mystics throughout the ages to convey their sense of the interwovenness and interdependence of all phenomena”. He argued that “we must visualize the web of life as living systems

interacting in network fashion with other systems.”(Capra, 1996:35). Similarly, Moore (2016:14) highlights the interdependence between human systems and natural systems— “nature as a whole... is nature as us, as inside us, as around us. It is nature as a flow of flows.”

Put simply, humans make environments and environments make humans—and human organization. Meadows (2008:3) notes that as the world becomes more complex, “systems thinking will help us manage, adapt, and see the wide range of choices we have before us.”

Goldin and Vogel (2010:5) argued that integration, technological progress, population and economic growth have enabled networks and are forging “exponential increases in the number of nodes and pathways through which transmission can occur at unimagined speeds and with global reach.”

Interconnectedness contributes to the transfer of capital, information, knowledge and a more robust world; however, it has the potential to spread systemic risks, resulting in greater fragility. Similarly, Ingram (2005, p. 522) notes that an increasing rate of 'multidimensional interconnectedness and integration' pose enormous governance challenges and risks in the 21st century. To Nye and Keohane (2001), interconnectedness is symptomatic of the "thickening" of globalism - that is, different relationships of interdependence intersect more deeply at different points. Understanding systemic relationships among different networks is more important than ever.

The New Synthesis Initiative has argued that addressing the problems of the 21st century calls for a significant mental shift from a mechanistic view of the world where the economic, social and environmental spheres are disaggregated elements to a dynamic perspective where the parts and the whole are one. NS focuses overall on understanding how the parts and the whole co-exist and co-invent each other.

System thinking is not new. However, it has re-emerged over the last five decades due to several scientific discoveries that have transformed the human understanding of the world. These concepts started to permeate social sciences and public administration during

the last 50 years. NS argues that systems thinking and a dynamic approach to problem solving are needed to invent viable and sustainable solutions to the complex problems of life in society.

This paper is structured in four parts:

- First, the paper provides an overview of the literature on system thinking. System thinking plays a key role in the *New Synthesis (NS) Initiative* (2011) and in the NS exploratory cycle. This section will also highlight how NS is making use of the system thinking paradigm (Bourgon, 2017).
- The second section provides a review of recent literature on complexity and complex adaptive systems. This section also discusses the relevance of these concepts to the New Synthesis of public administration.
- The third section introduces living system theory, its principles and concepts. It provides a brief overview of its relevance to public governance. This topic will be discussed in greater details in a subsequent PGI working paper.
- The last section provides some concluding observations.

# Old Ideas fit for This Time: System Thinking

An earlier paper titled “*Exploring New Frontiers in a World of Complex Interdependence: A New Synthesis for 21st Century Governance*” (Alorse, 2019), explored how the *New Synthesis (NS) Framework* blends System Thinking (ST), Complex Adaptive Systems (CAS) and Complexity Theory (CT). This paper is unpublished, but it was shared with colleagues in various countries that are participating in the NS Initiative. It provides the basis for this working paper.

This working paper explores the relevance of systems thinking and living systems theory to the New Synthesis of Public administration (NS). It captures insights from key authors and more recent works such as Capra and Luisi’s 2014 book on *The Systems View of Life*, Donella Meadows’ 2008 book, “*Thinking in Systems: A Primer*”, Stroh’s 2015 work, *Systems thinking for social change*, and Piero’s (2012) book on *Systems thinking: Intelligence in Action*.

Fritjof Capra’s 1996 seminal book, *The Web of Life: A New Scientific Understanding of Living Systems*, and his recent co-authored book, *The Systems View of Life: A Unifying Vision* provided a rich account of how the pendulum has swung periodically between *mechanistic thinking and holistic thinking*. Various philosophers and intellectual giants from different civilizations and from antiquities to modern time have periodically argued against a disaggregate view of the world and have put forward a holistic vision where the parts and the whole are inextricably linked, interconnected and interacting. The popular expression that “everything is connected to everything else” holds much truth and may be even more important today than at prior time. Such a holistic and organic view of life can be traced to the medieval cosmology of the ‘Great Chain of Being’ – actions in any one part of this network affect the whole (Grierson, 2016). However, it took the better part of the 20th century for scientific discoveries to demonstrate scientifically the significance of a dynamic, integrated and systemic understanding of the world.

Rene Descartes (1596 - 1650) saw human beings as “masters and possessors of nature”. Francis Bacon (1561 - 1626) saw science as a way to ‘enlarge the bounds of human empire’. The roots of a mechanistic perspective lie in the Scientific Revolution, which dates from the time of the astronomer Nicolaus Copernicus (1473-1543) to that of physicist Isaac Newton (1642-1727), and coincides with the beginnings of industrial capitalism (Grierson, 2016). Many of today’s problems arise from seeing society as separate from nature.

## A different way of thinking

The ideas set forth by scientific discoveries in biology, physics and mathematics during the 20th century gave birth to a different way of thinking that draws special attention to *connectedness, relationships and context*.

“The essential properties of an organism, or living system, are properties of the whole, which none of the parts have. They arise from the interactions and

relationships among the parts...Although we can discern individual parts in any system, these parts are not isolated, and the nature of the whole is always different from the mere sum of its parts.” (Capra, 1996: 29). For Capra and Luisi (2014), a “systems view” of life implies looking at a system in the totality of its multiple interactions. It calls for seeing “wholes”, understanding interactions and exploring dynamic non-linear behaviour. System thinking does not invalidate the importance of analytical approaches. On the contrary, a deep understanding of the constituent’s elements is needed to gain an appreciation of the dynamic interrelationships that cause a living system, be it an organism, a city or a society, to behave the way it does. Linda Sweeny summarised this well; “if we know how to complement analytical thinking with systems thinking, we will have a much more powerful set of tools with which to approach [problems]” (Sweeny, 2001:2).

In “*From Mechanistic to Social System Thinking*”, Russell Ackoff and Kellier Wardma (2018) explained that “to understand a system, analysis says to take it apart. But when you take a system apart, it loses all its essential properties. The discovery that you cannot understand the nature of a system by analysis forced us to realize that another type of thinking was required. Not surprisingly, it came to be called *synthesis*.” Similarly, Debora Hammond (2010:3) argued in *The Science of Synthesis* that while a great deal can be learnt through reductionist (or analytical) techniques, they lack “an integrative framework to put the pieces back together again...We must begin to learn the principles of synthesis, how to put the pieces back together and create wholeness.”

Michael Goodman (2018), a principal at Innovation Associates Organizational Learning, notes that systems thinking

highlights the *circular nature of the world* we live in. He describes system thinking as a diagnostic tool and a disciplined approach to examining problems. Systems thinking is essential for identifying patterns, and for understanding changing or adaptive behaviors. He argued that “Systems thinking *expands the range of choices* available for solving a problem by broadening our thinking and helping us articulate problems in new and different ways. At the same time, the principles of systems thinking make us aware that there are no perfect solutions; the choices we make will have an impact on other parts of the system. By anticipating the impact of each trade-off, we can minimize its severity or even use it to our own advantage. Systems thinking therefore allows us to make informed choices.” (Goodman, 2018).

Many of these conclusions parallel some of the key findings of the New Synthesis Initiative over the last 10 years:

- A mechanistic view of the world is insufficient to understand the complex issues of society.
- Conventional approaches are relevant, but insufficient to invent viable solutions to the complex issues we are facing collectively.
- There is a need for a broader mental map that encompass all aspect of life in society and a dynamic approach to collective problem solving that brings together an integrated whole the role of government, people and multiple agents in society.
- The economic, social, civic, and environmental spheres are inseparable facets of life in society.
- The role of the State is essential

and irreplaceable. It is the role of government to ensure that the overall balance serves and promotes the collective interests.

The New Synthesis of Public Administration amounts to a *paradigm shift* in thinking about the role of Government in society compared to the mechanical concept that prevailed in earlier times and a minimalist approach to problem solving that emerged in a number of countries during the mid-1980s.

### What is system thinking?

In “*Thinking in Systems: A Primer*”, Meadows (2008:188) defined a system as a “set of elements or parts that is coherently organized and interconnected in a pattern or structure that produces a characteristic set of behaviors, often classified as its “function” or “purpose.” The author asserts that complex behavior is created not only by the number of elements in a system but, to a greater extent, by the relationships among these elements. Well-designed systems can absorb forces and external shocks and still maintain their functionality. Poorly designed systems eventually collapse. The author argued that “we must *do things*, or at least *see things* and *think about things*, in a different way” (Meadows, 2008:4). Once we see the relationship between structure and behavior, we can begin to understand how systems work dynamically, what makes them produce poor results, and how to shift them into better behavior patterns. Like other system thinkers, the author is of the view that “systems happen all at once. They are connected not just in one direction, but in many directions simultaneously” (Meadows, 2008:5). The author notes that most systems work well because they are *resilient and self-organized*. Dynamic systems will often generate surprises because many relationships are nonlinear.

The book concludes by acknowledging the importance of leverage points. *Leverage points* may be used to affect system behavior in the most effective way. The author notes that the most effective leverage point is the ability to transcend and challenge current thinking. This subject has been discussed at length in the NS Fieldbook (Bourgon, 2017).

In *The Fifth Discipline: The Art and Practice of the Learning Organization*, Senge (1990) argued that one of the key problems in management is that simplistic thinking is applied to complex problems. This leads to focusing on the parts rather than seeing the whole and failing to see organizations as dynamic systems. Like Meadows (2008) and others, Senge is of the view that the essence of systems thinking lies in a shift of mind: seeing interrelationships rather than linear cause-effect chains and seeing processes of change rather than snapshots.

In Piero’s (2012) *Systems thinking intelligence in action*, the author referred to the logical foundations of system thinking as “the kingdom of circular processes”. He highlighted the importance of seeing the world as continually evolving; seeing connections between the parts and the whole as dynamic; and recognizing that the most interesting and useful connections among the elements that make up reality are not the linear ones but the feedbacks and loops, which make the elements not only connected but also interconnected, not only dynamic but also interactive.

System thinking is an integral part of The New Synthesis Framework and the New Synthesis Exploratory Cycle. The New Synthesis argues that system thinking and a holistic approach to problem solving play an essential role in preparing government for the challenges of the 21st century and in building the capacity of

government to invent solutions to the complex problems of this time.

## System Thinking and The New Synthesis Framework

The New Synthesis of Public administration transforms public administration from a mechanistic view to a dynamic and adaptive view of governance and the role of government in society. This is a paradigm shift in thinking about governing in the 21st century. The central idea is that public administration has been lacking a *Synthesis* to “coherently integrate past theories, conventions, principles and practices of enduring value with new ideas, principles and approaches better aligned to today’s reality of practice and future needs” (Bourgon, 2017: 53). The NS is designed to fill that void.

### A Holistic and Dynamic Concept of Governance

The NS argues that the conventional view of public administration has been inward-looking and did not give enough attention to the *dynamic* inter-relationships across systems. It sees the world from a binary perspective and through multiple separations including politics and administration, the public and private spheres, the governors and the governed, etc.

Disaggregated thinking makes it challenging to see the whole picture and to fully grasp how interactions among various components and actors have the potential to bring about better societal results. NS challenges this binary view of the world which is heavily influenced by mechanistic thinking. The New Synthesis champions a *holistic, adaptive, dynamic, co-evolving,*

*and iterative approaches* to collective problem solving and to inventing solutions to complex problems. The NS approach is consistent with system thinking paradigm that has influenced several major fields over the last five decades. In short, system thinking is embodied in every aspect of the NS framework and the NS Exploratory Cycle. They are aligned to the most recent literature in the field.

The NS framework promotes an *open, dynamic interactive system of governance* where an infinite number of choices and permutations are open to government. According to Bourgon (2017:62), the challenge for government is “to ensure that the overall balance serves the collective interest and propels society towards a better future.” Governments must be able to explore how a vast ecosystem of inter-related activities can be shaped and transformed to yield the desired societal results and steer society through an ongoing process of change.

### Governing as a Search for Balance

The NS *framework* was generated through large-scale international collaborative efforts involving public sector leaders and leading academics from a diversity of practice and disciplines with the explicit purpose of generating a conceptual frame better adapted to challenges that governments are facing in practice in this early part of the 21st century. The NS Initiative views modern governance as “an ongoing *search for balance* between the public, private and civil spheres of life in society. It entails a search for a delicate balance where the state authority is used to leverage the collective capacity of society to achieve results of higher value for society as a whole” (Bourgon, 2011:56). This is the *stewardship role of government* that is central to the New Synthesis of Public Administration

## Governing as an Applied Process of Invention

A “*New Synthesis*” is a pathway to a better future that can only be crafted in practice by the people who have the right to use the authority of the state as a lever to enroll the contribution of others to achieve a common purpose (Bourgon, 2011). A “*New Synthesis*” is a pathway that brings together multiple elements interacting holistically to generate the desired public outcomes. As a result, governments must balance the use of the compliance, performance, emergence and resilience functions. Governments must be able to govern (*compliance*), the state apparatus must be able to get things done (*performance*), government interventions must encourage collective problem solving to invent viable and sustainable solutions to the problems of living in a modern society (*emergence*) and society must be able to absorb shocks and disturbances, prosper in unforeseen circumstances and co-evolve with the world we live in (*resilience*). A “*New Synthesis*” balances in practice the need for compliance, performance, emergence and resilience functions of modern government (Bourgon, 2011:95). It explores how government actions and interactions can be used to create ripple effects across multiple systems to propel society forward.

The New Synthesis of Public Administration argues that the problems of a world characterised by increasing complexity, hyper-connectivity, high uncertainty and an increasingly fragile biosphere cannot be understood through disaggregated thinking or addressed through disjointed interventions.

The New Synthesis of Public Administration recognizes government activities and interventions as a *process of invention* aimed at transforming society and influencing behaviors to achieve more

desirable outcomes. It champions thinking across scales and collective problem-solving. The NS Framework blends systems theory, adaptive system thinking and complexity theory to encourage exploration and invention of viable and pragmatic solutions to complex issues. It brings together in a coherent whole insight from different disciplines. From a NS perspective, the magic is not in the various elements but instead in *how all the pieces can be brought together to generate a new and emergent reality*.

The New Synthesis (NS) framework helps public sector leaders to identify the most important lines of inquiry. It is “a tool that can help practitioners examine and challenge their assumptions and explore the full range of options at their disposal... [it] help[s] to reveal the implications that various choices entail” for society, across sectors and over time. It recognizes that government decisions about what to do and how to proceed are highly contingent and that these decisions can only be made in the unique circumstances of each country.” (Bourgon, 2011: 33).

## The New Synthesis Exploratory Cycle

The New Synthesis (NS) exploratory cycle is the result of many NS workshops conducted between 2011 and 2016 in Canada, Malaysia, Singapore, Finland, Denmark, Estonia, etc. More than 1,000 public sector leaders participated in this work. The results have been published in *The New Synthesis of Public Administration Fieldbook, 2017*. It documents what was learned from practice. At the heart of this work was the question: “*What do we need to do to ensure that the capacity of government to invent solutions to the problems facing society keeps pace with the increasing complexity of the world we live in?*”

The NS Exploratory Cycle is a systematic and deliberate exploratory approach to improving the likelihood of success of government interventions. The process is *systematic* because it brings together in a comprehensive way several phases to inventing solutions. It is *dynamic* because it considers how various elements are interacting and influencing one another. It is *iterative* because people leading public transformation are likely to go through the various phases several times as the exploration progresses, and more people come on board.

The NS Exploratory Cycle recognises the importance of the *inter-relationships* between agency, system-wide and societal results. It invites public sector leaders to frame issues in societal terms and to articulate the higher public purpose that would be served through proposed government interventions. Defining what success means for society influences the way one conceives of a system-wide effort and the contribution that various actors may make. Similarly, an initiative launched at an agency level may launch a ripple across government that may end up transforming society. The implication is that a public transformation process may start at any level; it can be top down (e.g., government priorities) or bottom-up (e.g., small initiative expanding on a bigger scale). The implication is also that public sector leaders must be able to think at multiple levels and act at their scale with the resources and capabilities available to them in real time.

The NS Exploratory Cycle (Bourgon, 2017; 73-128) is framed around four main phases:

**I. The Power of a Broader Mental Map (Positioning):** This phase helps public sector leaders to frame the issues they are facing in societal terms. What societal results do they aspire to generate? What would

success look like? It explores the interrelationship between agency level activities in the broader context of the desired system-wide, government-wide and societal results to gain an appreciation of the effects of possible government interventions, and their impacts on the public, private and civic spheres.

**II. The Power of Others (Leveraging):** This phase explores how to use the authority of the State as a lever to harness the collective power of society in order to generate the desired societal results. The key finding is that there are always enough resources around to make progress if we are smart enough to pool existing knowledge, know-how and capabilities across government and across sectors.

**III. The Power of Citizens as Public Value Creators (Engaging):** This phase explores how a different sharing of responsibility between government, citizens, families and communities may yield better public results, and at a lower overall cost for society. It searches for ways to transform the relationship between the public sector and citizens from one of dependency to one of mutuality and shared responsibility.

**IV. The Power to Lead Public Transformation (Synthesising):** At the end of the day, everything must fit together. This phase is a *search for balance* between compliance, performance, emergence and resilience functions. Too much reliance on government may stifle innovation, not enough may disperse a lot of energy without much progress.

The NS Exploratory Cycle acknowledges that leading public transformation is deeply circumstantial and contextual. It “expands the range of possibilities open to government, improves the likelihood of success of government interventions and builds the capacity for collective problem solving. It provides practitioners with a deliberate approach to think their way through complex issues and to find their way towards results of increasing public and civic value”. (Bourgon, 2017:140).

Overall, the NS exploratory cycle helps practitioners weave together the many strands needed to lead society through a process of change. It provides a way to *do systematically* what some leaders are doing instinctively, that is, discover a pathway to a better future.

## Complex Adaptive System Thinking to Understand Complex Issues

Challenges such as rising inequalities, the increasing prevalence of chronic diseases, homelessness, population migration, environmental degradation or climate changes are complex issues. They cannot be addressed in isolation. Multiple factors are at play and the actions of multiple agents in various parts of the world are transforming the issues and the context within which a solution must be found to make progress.

Bourgon (2011:32) argues that “to invent solutions” government cannot rely on the same ideas that have given rise to the issues in the first instance or on past practices that were proven to be wanting. Instead, Government must re-think the issues from a broader perspective and re-invent solutions that have a higher likelihood of success and that can also build the *adaptive capacity* of society. Similarly, Bentley and Wildson (2003: 26) note that in “complex circumstances, people and organisations have to become *adaptive* ... public services should be understood as *complex adaptive systems* and not according to the mechanistic models that have traditionally dominated government thinking.”

### Complex Adaptive Systems (CAS)

In the second half of the 20th century, the study of complex phenomena was progressively applied to human economics,

psychology, biology, cybernetics, anthropology and the natural sciences (The Health Foundation, 2010). Over the past decade or so, the concepts of complex adaptive systems have started to be used more extensively in healthcare, education and the social sciences.

Human (2016:427) defined a complex system as “a network of rich interactions which change over time. It is not the number of parts which defines complexity but rather the nature of their interactions among the parts. These interactions are non-linear, meaning that one cannot add up the interactions in a system in order to measure their effects.” Small changes in one part of the system may have disproportionate impact on the behavior of the overall system. Similarly, Cordon (2010) noted that complex adaptive systems are made up of “interacting components whose interactions may be complex and whose components are diverse and/or have a capacity for learning

that generates reactive or proactive *adaptive behavior*.”

Abbott and Hadžikadić (2017) observed that Complex adaptive systems (CAS) are all around us. Some of these include ecosystems, financial markets, the brain, ant colonies, economies, and many other examples where large numbers of constituents independently interact. Similarly, Bourgon (2009) noted that governments are ‘complex systems’ that interact with numerous other complex systems, such as the human community, the global economy, the natural environment or the world wide web, to name a few. *Governments are complex and adaptive systems*: complex in that they are diverse and made up of multiple interconnected networks; adaptive in that they have the capacity to change and learn from experience” (Bourgon, 2009:12).

A complex adaptive system “cannot be created, designed or controlled by individual actors.” (Aagaard, 2012: 724). The most frequently mentioned characteristics of CAS in the literature are as follows (Dodder and Dare (2000):

- CAS are composed of a network of *many agents* gathering information, *learning and acting* in parallel in an environment produced by the interactions of these agents.
- The system *co-evolves* with its environment.
- Order is *emergent*, instead of pre-determined, always unfolding and always in transition.
- CAS tend to exist at *many levels* in the sense that agents at one level are the building blocks for agents at the next level.

- CAS, by their nature, have a future that is hard to *predict*.

In summary, the key characteristics of complex adaptive systems include co-evolution, emergence, non-linear interactions, feedback loops, self-regulation, iteration, unpredictability, etc. All these characteristics are reflected in the work on the New Synthesis of Public Administration.

The literature also stresses the importance of *feedback loops*. Capra and Luisi (2014) define a feedback loop as “a circular arrangement of causally connected elements, in which an initial cause propagates around the links of the loop, so that each element has an effect on the next, until the last “feeds back” the effect into the first element of the cycle”. The consequence of this arrangement is *self-regulation* in an entire system. Examples of feedback, which can either be reinforcing (positive) or balancing (negative) can be found in most complex systems in biology, physics, economics, social systems, and engineering. Although NS contributes to the generation of ripple effects and virtuous cycles in diverse governance systems, the importance of feedback mechanisms has been insufficiently considered in the work on the New Synthesis Initiative. Feedback loops will be examined further in another section of this paper.

### *Complex Adaptive Systems and the New Synthesis of Public Administration*

Modern societies are constructed out of a multitude of complex and dynamic systems. As a result, governing in the 21st century require a “dynamic understanding of the role of government in society. This includes an adaptive understanding of the

interaction between the public, private and civic spheres of life in society, a deeper appreciation of the importance of civic results and the role of citizens in building governable societies.” (Bourgon, 2017:21). Addressing intractable problems require understanding the complexity of ‘*multiple system interactions*’ (Bourgon, 2009).

The New Synthesis Initiative acknowledges that public transformations go through multiple phases. NS narratives are used to capture the essence of the transformation process as it is taking shape through action. The NS Discovery process is *iterative*. Public sector leaders are likely to reframe the challenge they are attempting to resolve and the pathway to a better future several times as their search for solution progresses and as more people are coming on board (Bourgon, 2017). To move from one’s current reality to a new reality requires shared awareness, shared learning and shared responses (see *fig. 1*). For instance, the *exploration phase* helps to generate a shared awareness of the challenges at hand as people re-think the issue from a different perspective, articulate the challenges in societal terms, and explore how to re-position their contribution. During the *transition phase*, narratives are used to reinforce the common sense of purpose, capture the collective journey, celebrate the group’s efforts and articulate why the initiative is worthy of support. During the *transformation phase*, key elements are consolidated, changes are institutionalised, and measures are introduced to ensure the sustainability of the new reality. The narrative of change during this phase encourages broad ownership and support.

The New Synthesis Exploratory Cycle champions the idea that a successful transformation must build the capacity to adapt, evolve and lay the basis for the changes to come. It acknowledges the importance of co-evolution with a changing environment, iteration as the partnership is expanding, self-organisation, interactions at multiple levels, collective learning, collective capacity building and resilience. These features are consistent with the core characteristics of complex adaptive systems mentioned earlier.

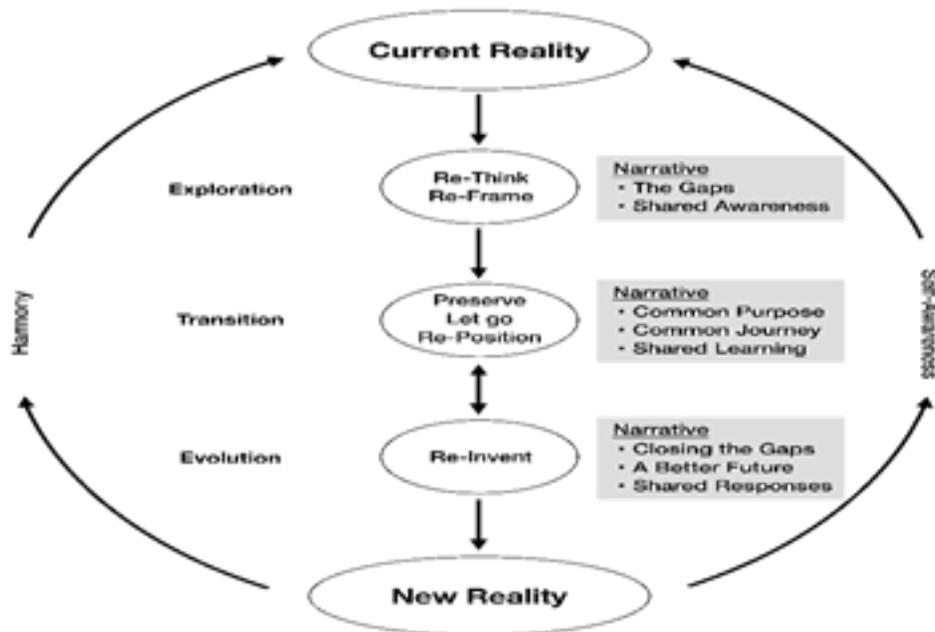


Fig. 1 Leading Public Transformation - Narratives of Change (Bourgon, 2017)

The New Synthesis initiative argues that government actions and interventions are deliberately designed to transform the world we live in and that the role of government is transformed by the actions of others. Every government's actions, decisions and interventions are intended to change the course of events and the interactions between the public, the private, civic and environmental spheres of life in society (Bourgon, 2017).

The NS conceptual framework and the NS exploratory cycle blends systems theory, adaptive system thinking and complexity theory in an integrated theory to explore the diverse dimensions of complex issues, invent sustainable and pragmatic solutions, learn from practice and course correct and adapt as needed.

The solution generated by public sector leaders to complex issues does not reside in the various elements but instead in *how all the pieces are brought together to form a new whole* (Bourgon, 2017). A New Synthesis brings together the role of government, people and multiple agents in society in a co-dependent and dynamic approach to collective problem solving. The New Synthesis builds the capacity of government to learn and adapt to changing needs and circumstances. It builds societies resilience and the capacity to co-evolve with its changing environment.

## Living Systems Thinking

*Living systems* are a subset of general systems and they have similar features of complex adaptive systems. They deserve special attention by public sector leaders because of their potential to provide insights for the governance of human communities.

### What are Living Systems?

Sweeney (2011), uses the expression "*living systems* as a metaphor, to represent an animate arrangement of parts and processes that continually affect each other. There are living systems at all scales, from the smallest plankton, to the human body and the planet. Family, business and even a country are examples of living systems". According to Sweeney (2011), one way to identify a living system is by observing if it changes over time; living systems grow and evolve. Another way is to observe how the parts are interacting. Mechanical systems display a direct relationship between problem and solution (e.g., if a telephone stops working, someone can fix it): this is not the case for living systems.

Living systems have a *diversity of patterns* of connection and interaction, webs and networks capable of producing breathtaking synergy. To understand living systems means to gain an appreciation of the connections that make up a whole system and of the patterns revealed by these interconnections (Sweeney 2011). This, once again, calls for a shift from a mechanistic view of the world towards a dynamic and holistic perspective.

### What are the Principles of Living Systems?

In *The web of life*, Capra (1996) highlights the importance of ecological literacy for collective problem solving. He argues that we must "understand the principles of organization, common to all living systems, that ecosystems have evolved to sustain the web of life" (2003: 201). Capra (2012)

has developed the concept of “Nature’s Patterns and Processes” with the Center of Ecological Literacy (CEL) in Berkeley, California, and defines six principles that characterize living systems:

- **Nested systems** - “Nature is made up of systems that are nested within systems. Each individual system is an integrated whole and—at the same time – part of larger systems.” (CEL, 2012)
- **Cycles** - “Members of an ecological community depend on the exchange of resources in continual cycles” (CEL, 2012).
- **Flows** - “Each organism needs a continual flow of energy to stay alive. The constant flow of energy from the sun to Earth sustains life and drives most ecological cycles” (CEL, 2012).
- **Development** - “All life – from individual organisms to species to ecosystems – changes over time. Individuals develop and learn, species adapt and evolve, and organisms in ecosystems coevolve.”
- **Dynamic Balance** - “Ecological communities act as feedback loops, so that the community maintains a relatively steady state that also has continual fluctuations. This dynamic balance provides resiliency in the face of ecosystem change” (CEL, 2012).

These characteristics capture some of the central themes covered in living systems literature, including *self-organization*, *feedback loops* and *autopoiesis*. For instance, Woodruff and colleagues (2007) note that living systems are open *self-organizing* life forms that interact with their environment. Living systems are maintained by flows of information, energy and matter. The relevance of these

concepts to public governance will be examined under the subsequent section, Living Systems Theory (LST).

In a short article, “*Patterns, Flows, and Interrelationship*”, Brown (2002) notes that a general living systems theory moves away from breaking things down into their elementary components and focus instead on exploring phenomena in terms of *dynamic patterns of relationships* between organisms (organisations) and their environment. The author explains that “certain patterns of relationship and information flow seem to inhere in all living systems, in plants, animals, ecosystems, social groupings, communities, and organizations. Out of these patterns, our very universe forms itself, and all life within it”. Brown (2002) is also of the view that living systems display common key characteristics:

- They function as “a whole”, manifesting properties that are not evident in its parts;
- The “parts” of each “whole” are also “wholes.”
- Living system are made up of subsystems that in turn holds membership in one or more larger systems, forming a kind of “*nested hierarchy*”
- Living systems respond to change; they survive and thrive within constantly *changing environmental conditions*, and with the constant flow through them of energy, substances, and information.
- Living systems adapt to changes in their environment, and *they learn*, grow, develop and *evolve*.

In *Connected Wisdom*, Sweeney (2011) also highlights some of the key principles that characterize living systems. This includes interdependence; systems integrity; diversity; cooperation and

partnership; feedback mechanisms and non-linearity.

The principles of living systems outlined by Capra and CEL (2012) bare striking similarities to Brown's (2001) principles, Diamond's (2009) "12 Rules of Living Systems" (see appendix 2), the New Synthesis of Public administration and Sweeney's 2011 work.

### *Living Systems Theory (LST)*

James Miller (1978) is widely recognized as the author that laid the foundation for a *general theory of living systems*. His book, *Living Systems*, focused on the structure, interaction, behavior and development of living systems. Miller described eight "nested" levels of living systems. Each higher level contains the lower level in a nested fashion. Miller's view is that life is a continuum (1978:1025). Living systems are organized into subsystems that performs essential functions (Miller 1992).

Parent (1996) describes living systems as "open self-organizing systems" that have the special characteristics of life and interact with their environment. Living systems can be as simple as a single cell or as complex as a supranational organization such as the European Union. Regardless of their complexity, they depend on similar functions (subsystems) to survive and to continue to evolve. Another key feature emerging from the literature on living systems theory is the concept of *feedback loops* – "a circular arrangement of causally connected elements, in which an initial cause propagates around the links of the loop, so that each element has an effect on the next, until the last "feeds back" the effect into the first element of the cycle" (Capra and Luisi (2004). Feedback loops result in the *self-regulation* of the entire system.

The concept of *autopoiesis* ("self-making") is also central to living systems. Autopoiesis, or "self-making," is a network pattern in which the function of each component is to participate in the production or transformation of other components in the network. In this way, the network continually makes itself.

## Living Systems Thinking and Relevance for New Synthesis Initiative

The New Synthesis of Public administration has integrated the core principles of living systems thinking. This transforms public organisations into open systems more dynamically connected to their environment and in constant interactions with multiple agents in society. This underlines the importance of feedback loops and the need for government to explore and encourage self-organisation, the co-creation of solutions and the co-production of public results. NS has argued that public organisations that do not actively explore the potential for self-organisations and co-production do not fulfill their mission, shortchange government by reducing "the range of options available to government and impose a higher cost than necessary on society" (Bourgon, 2017:59).

Contrary to a 'closed-system' perspective whereby agencies assume that they do not require much interactions with their environment (e.g., operating with minimal interaction with others), NS calls for an '*open system of governance*' whereby governments interact with other systems in their external environments (Bourgon, 2011). An open concept of governance sees the economic, social, political, technological and environmental systems as intertwined and interdependent (Bourgon, 2011).

Recent research indicates that people are happier when they have an opportunity to work together towards solutions. This in turn reinforces a *positive feedback loop* of increasing trust, positivity and well-being (Bourgon, 2011). Increasing social capital through collaboration has the potential to enhance citizen’s contributions to their communities. NS champions the idea that human agency is critical for public transformation and for generating the public results that people value most.

To fully play their role, governments must possess the legitimacy to act on behalf of society. After all, “the state is the ultimate risk taker in society” (Bourgon, 2017: 146). Government takes risks on a scale that no other sector or agent in society could take on and intervenes in areas where the forces of the market or the capacity of civil society would be unable to go.

In many ways, governments are enablers of *self-organisation* in the private and civic spheres. Active citizens self-organise and act to address complex issues affecting them. Voluntary organisations operate with or without the support of government. Bourgon (2017) asserts that in order to achieve viable solutions, public organizations must be able to work across a web of interrelationships, across government and across sectors to generate practical solutions by making the best possible use of existing resources, means and capabilities.

## Concluding Observations

The 21st century world of governance is characterized by complexity, interrelationships, and unprecedented velocity of change. This poses significant challenges to governments and public sector leaders. The NS Initiative has argued that governing in this era requires a *different* way of thinking than the one inherited from the industrial age. It calls for a significant mental shift from seeing the world as a series of *disaggregated* elements to a dynamic perspective where the parts and the whole are one (*system or holistic thinking*).

This paper notes that the holistic view of the world that one could readily find in the work of philosophers in earlier times was progressively replaced by a “mechanistic metaphysic” way of thinking in the late 19th and early 20th centuries. Scientific discoveries in physics, biology, ecology, cybernetics, etc. in the mid-20th century have revealed the need for a *different way of thinking*. The complex problems we are facing cannot be understood in isolation and cannot be solved through disaggregated interventions.

NS has put forward a holistic, dynamic and interactive view of governance and of the role of government in society. This

paper examined recent literature on system thinking, complexity theory, complex adaptive system and living system. It confirms that the *New Synthesis of Public Administration* and the NS Exploratory Cycle (Bourgon, 2017) are well aligned with the most recent findings in the literature. It explored how system thinking is embodied in New Synthesis (NS) thinking—an approach that provides a *paradigm shift* in thinking regarding serving and governing in the 21st century.

The first section of the paper provided an overview of the literature on system thinking. It noted that System thinking plays a key role in the *New Synthesis (NS) Initiative* and it highlighted some of the

converging ideas (Bourgon, 2011, 2017, 2019). The second section explored recent literature on complexity and complex adaptive systems (CAS) as a way of understanding complex issues. This section discussed the relevance of CAS concepts to the New Synthesis of Public Administration. The third section introduced briefly the living system theory and provided a brief commentary about its relevance to NS. Human living systems are different from non-human living systems. These differences will be explored separately in a subsequent Working Paper.

### *Originality of NS and Observations from the Literature*

New Synthesis (NS) Initiative is an innovative and paradigm-shifting approach to serving and governing in the 21st century. The NS approach blends systems theory, adaptive system thinking and complexity theory to encourage exploration and invention of viable and pragmatic solutions to complex issues; it is *atypical* of how conventional public administration is conducted. It involves large-scale international collaboration with distinguished academics from a variety of disciplines and senior public sector leaders from countries with different governing systems operating in very different contexts, cultures and circumstances; it focuses strongly on the needs of public sector leaders championing transformations; It stresses the importance of the interrelationships between government, people and society; it creatively bridges the gap between theory and practice (fusion of practice and academia); it transcends borders and disciplinary divides; it champions building resilience, innovation and reinvention in diverse environments; and it stresses the inescapable stewardship role of the state

in society. The NS Initiative calls for a significant mental shift from seeing the role of government as a series of disaggregated actions and decisions to a dynamic perspective that brings together the role of government, citizens and society to generate solutions to the complex problems we are facing collectively. The New Synthesis (NS) is about thinking and governing differently. It's about shifting one's mindset to see the 'wholes' and embracing the idea that "governing is a delicate process of constructive deconstruction where the authority of the State is used to ensure stability and initiate actions to transform society." (Bourgon, 2017:62).

The NS approach is consistent with system thinking paradigm that has influenced several major fields over the last five decades. In short, system thinking is embodied in every aspect of the NS framework and the NS Exploratory Cycle. They are aligned to the most recent literature in the field.

However, the literature review reveals that the NS Initiative has paid insufficient attention to the environment, the interactions between human systems and other living systems, and the importance of ecological literacy for public sector leaders. There is a need to increase ecological literacy among the general population, especially among policy decision-makers. Considering that all living systems are 'webs of relations', ecological literacy is essential for understanding the interconnected nature of policy issues. This could be achieved through education by mass media, interactive education, formal educational channels and outreach activities by scientists.

Moreover, the importance of feedback mechanisms has been insufficiently

considered in the work on the New Synthesis Initiative. These could be further explored by building on the following NS concepts: 'think total system' approach, the concept of 'ripples' and 'positive feedback loops' that contribute to virtuous cycles and social capital.

Furthermore, the literature review has revealed that NS Initiative must undertake further work on the functioning of human living systems. The current literature on human living systems remain relatively sparse and it does not provide much insights to guide government actions and decisions. This topic will be explored more deeply in a separate PGI working paper. The NS hypothesis is that unlike non-human living systems, 'self-regulation' and 'self-organising' in human communities require some form of public intervention. Government interventions are needed to ensure that self-organisation in the private and civic spheres of life in society will also serve the overall interest of society. Government interventions are needed to ensure that the pursuit of self-interests will promote the collective interests. Furthermore, the view is that the private sphere of life in society is not self-regulating because it does not automatically take into account the social and environmental costs of economic actions and decisions (Bourgon, 2017).

# APPENDIX

## APPENDIX 1- Online blog by Linda Sweeney

### Appendix 1- Thinking About Systems: 12 Habits of Mind by Linda Sweeney - Online blog

<http://www.lindaboothsweeney.net/thinking/habits>

The complexity of our worlds demand that we develop “habits of mind” to intentionally use systems principles to understand the complexity of everyday situations and to design desired futures.

In system thinking, you:

- 1. See the Whole:** See the world in terms of interrelated “wholes” or systems, rather than as single events, or snapshots;
- 2. Look for Connections:** Assume that nothing stands in isolation; and so you tend to look for connections among nature, ourselves, people, problems, and events;
- 3. Pay Attention to Boundaries:** “Go wide” to check the boundaries drawn around problems, knowing that systems are nested and how you define the system is critical to what you consider and don’t consider;
- 4. Change Perspective:** Change perspective to increase understanding, knowing that what we see depends on where we are in the system;
- 5. Look for Stocks:** Know that hidden accumulations (of knowledge, carbon dioxide, debt, and so on) can create delays and inertia;
- 6. Challenge Mental Models:** Challenge your own assumptions about how the world works (your mental models) – and look for how they may limit thinking;
- 7. Anticipate Unintended Consequences:** Anticipate unintended consequences by tracing loops of cause and effect and always asking “what happens next?”;
- 8. Look for Change over Time:** See today’s events as a result of past trends and a harbinger of future ones;
- 9. See Self as Part of the System:** Look for influences from within the system, focusing less on blame and more on how the structure (or set of interrelationships) may be influencing behavior;

**10. Embrace Ambiguity:** Hold the tension of paradox and ambiguity, without trying to resolve it quickly;

**11. Find Leverage:** Know that solutions may be far away from problems and look for areas of leverage, where a small change can have a large impact on the whole system;

**12. Watch for Win/Lose Attitudes:** Be wary of “win/lose” mindsets, knowing they usually make matters worse in situations of high interdependence.

## Appendix 2 - 12 Simple Rules of Living Systems (2009)

Louise Diamond, Ph.D.

<http://sunray.org/ngo/wp-content/uploads/2018/03/Twelve-Simple-Rules-Edited-Version-2018.pdf>

### 12 Simple Rules of Living Systems (2009)

1. In complex systems, all the elements or agents are interconnected, as in a giant web. They are also interdependent - what happens to one affects all others. Therefore: **Connect the disconnected.**

2. Complexity is the nature and condition of living systems and the world we live in. What we know about complex systems is that there are multiple agents or elements, combining and interacting in unpredictable and non-linear ways. This means decisions often lead to unintended consequences. Therefore: **Ground yourself in unpredictability.**

3. In that giant web of interconnectedness, the points or nodes where the agents meet are the relationships, or opportunities for interaction. These interactions determine what will happen to the system. The nature and quality of these relationships, therefore, are critically important. Therefore: **Create conditions for quality engagements.**

4. We know that all living systems exchange energy, matter, and information across their boundaries. When we can identify imbalances in these flows - stuck places, over- or under-accumulation, etc - we can shift things to be more equitable and more sustainable. Therefore: **Re-balance the flows across boundaries.**

5. All living systems develop patterns. Often these patterns are self-reinforcing and become deeply embedded and difficult to change. Many of these patterns in human systems are common and recognizable. Patterns also show up in similar forms at different scales or levels of the system. Therefore: **Re-pattern for sustainability and well-being of the whole.**

6. We know from living systems that everything is a whole in itself and at the same time part of a larger whole. Therefore: **Attend to ever smaller parts and ever larger wholes.**

7. Living systems organize themselves through the interactions of their agents or parts. The basic format of that organization is networks - that is, groups of parts joined together in a de-centralized way for some period of time. Therefore: **Pay attention to emerging networks.**

8. Systems move between various degrees of stability and instability, order and disorder. When the disorder, or chaos, becomes too great, things fall apart. When the order is too rigid, things cannot grow or develop. Yet a certain degree of instability, or the edge of chaos, can also be a powerful moment of creative change. Therefore: **Seek coherence within chaos.**

9. All living systems exist within a single field of potential, where the observer is a player, our thoughts have consequences, and creative solutions emerge. Therefore: **Look to the intangible as well as the concrete to see the potential.**

10. Living systems exist within their own unique context. For human systems, that context is the narrative that gives meaning to our choices and actions. Therefore: **Articulate, communicate, and validate the stories you tell yourself.**

11. The parts of living (human) systems cohere around a common shared purpose. Therefore: **Define and revisit goals and purpose.**

12. Living systems are learning systems. That is, they adapt from the feedback they receive from their internal and external environments. Therefore: **Learn and change from inner and outer messages.**

## Bibliography:

- Abbott R., Hadžikadić M (2017). Complex Adaptive Systems, Systems Thinking, and Agent-Based Modeling. In: Hadžikadić M., Avdaković S. (eds) *Advanced Technologies, Systems, and Applications*. Lecture Notes in Networks and Systems, vol 3. Springer, Cham
- Academy for Systems Change (n.d). "Everything is Connected to Everything Else." Accessed April 15, 2019 from <https://www.academyforchange.org/everything-connected-everything-else/>.
- Ackoff, Russell and Warda, Kellie (2018). "From Mechanistic to Social System Thinking" Accessed April 10 2019 from <https://thesystemsthinker.com/from-mechanistic-to-social-systemic-thinking/>
- Alorse, Raynold Wonder. 2019. "Exploring New Frontiers in a World of Complex Interdependence: A New Synthesis for 21st Century Governance." In Bourgon, Jocelyn (ed). 2019 'New Synthesis of Public Administration Working Papers'. Public Governance International.
- Bourgon, Jocelyn (2019). "A State of Mind fit for the 21st Century." International Review of Administrative Sciences (forthcoming).
- Bourgon, Jocelyne (2009). New Directions in Public Administration: Serving Beyond the Predictable. *Public Policy and Administration* 24 (3): 309-30.
- Bourgon, Jocelyne (2011). *A New Synthesis of Public Administration: Serving in the 21st Century*. Montréal: School of Policy Studies, Queen's University.
- Bourgon, Jocelyne (2017). "The New Synthesis of Public Administration Fieldbook". Copenhagen, Dansk Psykologisk Forlag A/S.
- Brown, Molly Young (2002). "Patterns, Flows, and Interrelationship". Accessed April 12 2019 from [https://web.archive.org/web/20090108122526/http://www.mollyyoungbrown.com/systems\\_article.htm](https://web.archive.org/web/20090108122526/http://www.mollyyoungbrown.com/systems_article.htm)
- Capra, Fritjof, and Luisi, Pier (2014). *The Systems View of Life: A Unifying Vision*. Cambridge: Cambridge University Press.
- Capra, Fritjof (1996). *The web of life: a new scientific understanding of living systems*. New York: Anchor Books.
- Center for Ecoliteracy (CEL). (2012). Explore: Ecological principles. Retrieved April 15, 2019 from <http://www.ecoliteracy.org/nature-our-teacher/ecological-principles>
- Cordon, Charissa (2010). System Theories: An Overview of Various System Theories and Its Application in Healthcare, *American Journal of Systems Science*, Vol. 2 No. 1, pp. 13-22.

Diamond, Louise (2009). 12 Rules of Living Systems. Accessed April 15, 2019 from <http://sunray.org/ngo/wp-content/uploads/2018/03/Twelve-Simple-Rules-Edited-Version-2018.pdf>

Goldin, Ian, and Tiffany Vogel (2010). Global Governance and Systemic Risk in the 21st Century: Lessons from the Financial Crisis: Governance and Systemic Risk. *Global Policy* 1 (1): 4-15.

Goodman, Michael (2018). "Systems Thinking: What, Why, When, Where, and How?" Retrieved from <https://thesystemsthinker.com/systems-thinking-what-why-when-where-and-how/>

Grierson, David (2016). The Shift from a Mechanistic to an Ecological Paradigm. *International Journal of Environmental*. Vol 5. No. 5

Hammond, Debora (2010). *Science of Synthesis: Exploring the Social Implications of General Systems Theory*. University Press of Colorado.

Hammond, Debora (2010). *Science of Synthesis: Exploring the Social Implications of General Systems Theory*. University Press of Colorado.

Harvard Business School (2001). Governance in a Globalizing World - A World Interconnected By "Thick Globalism". Accessed at <https://hbswk.hbs.edu/archive/governance-in-a-globalizing-world-a-world-interconnected-by-thick-globalism>

Human, Oliver (2016). Complexity: E-special introduction. *Theory, Culture & Society* 33 (7-8): 421-40.

Ingram, Alan. (2005). 'The New Geopolitics of Disease: Between Global Health and Global Security', *Geopolitics*, 10, pp. 522-545.

Meadows, Donella H (2008). *Thinking in Systems: A Primer*, Chelsea Green Publishing, White River Junction, VT.

Mella, Piero (2012). *Systems thinking: intelligence in action*. Heidelberg: Springer.

Miller, James Grier (1978). *Living systems*. McGraw- Hill. New York.

Miller, Jessie L., and James Grier Miller (1992). *Greater than the sum of its parts. sub systems which process both matter-energy and information*. *Behavioral Science* 37 (1):

Moore, Jason W (2016). *Capitalism In The Web Of Life: Ecology And The Accumulation Of Capital*. London: Verso.

Paper drafted by Raynold Wonder Alorse, Public Governance International

Senge, Peter (1990). *The Fifth Discipline: The Art and Practice of the Learning Organi-*

zation. Doubleday, New York.

Stroh, David Peter (2015). *Systems thinking for social change: a practical guide to solving complex problems, avoiding unintended consequences, and achieving lasting results*.

Sweeney, Linda Booth (2011). *Connected Wisdom: Living Stories about Living Systems*. Cork: BookBab.

Sweeney, Linda (2001). "Systems Thinking: A Means to Understanding our Complex world" Pegasus Communications. Retrieved January 8, 2019 from [http://scpsystem.weebly.com/uploads/2/1/3/3/21333498/linda\\_booth\\_sweeney\\_-\\_systems\\_thinking\\_a\\_means\\_to\\_understanding\\_our\\_complex\\_world.pdf](http://scpsystem.weebly.com/uploads/2/1/3/3/21333498/linda_booth_sweeney_-_systems_thinking_a_means_to_understanding_our_complex_world.pdf)

Bentley, Tom and Wilsdon, James (2003) 'Introduction: The Adaptive State', in Bentley, Tom and Wilsdon, J. (eds), *The Adaptive State— Strategies for Personalising the Public Realm*, Demos, London.

The Health Foundation, 2010. Evidence Scan: Complex Adaptive Systems. Accessed on April 15, 2019 from <https://www.health.org.uk/sites/default/files/ComplexAdaptiveSystems.pdf>

Woodruff, T. Sullivan; John Baross (October 8, 2007). *Planets and Life: The Emerging Science of Astrobiology*. Cambridge University Press.



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